

Diagnostic Fault Codes For Cummins Engines

Applies to Engine Models QSB T2, QSC T2, QSL T2, QSM11, QSX15, QSK19, QSK23, QST30, QSK45/60/78

Note: These fault codes are current at date of publication. Always refer to engine service manual for the latest information related to engine diagnostics and troubleshooting. Contact your local Cummins dealer for more information.

Fault Severity Level	Fault Severity Function	Action To Be Taken By Operator
1	Stop	Stop Engine Now – Damage Imminent
2	Warning	Warning – Engine May Continue to Run, but Must Be Repaired the Same Day
3	Maintenance	Maintenance – Repair At The Next PM
4	None- Information Only	None – No Lamp Action

FAULT CODE (LAMP)	SID(S) PID(P)	SPN	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
	FMI	FMI										HHP Level Number (**)		
111 (Red)	S254 12	629 12	Engine Control Module – Critical internal failure	X	X	X	X	X	X	X	X	3	3	3
112 (Red)	S020 7	635 7	Engine Timing Actuator is not responding to ECM commands						X	X		2	2	2
113 (Yellow)	S020 3	635 3	Engine Timing Actuator Circuit - shorted high						X	X	X	2	2	2
114 (Yellow)	S020 4	635 4	Engine Timing Actuator Circuit - shorted low								X			
115 (Red)	P190 2	190 2	Engine Speed/Position Sensor Circuit - lost both of two signals from the magnetic pickup sensor	X	X	X	X	X	X	X	X	2	2	2
116 (Red)	P156 3	156 3	Fuel Timing Pressure Sensor Circuit - shorted high		X	X			X	X		2	2	2
117 (Red)	P156 4	156 4	Fuel Timing Pressure Sensor Circuit - shorted low		X	X			X	X		2	2	2
118 (Yellow)	P135 3	135 3	Fuel Pump Delivery Pressure Sensor Circuit - shorted high		X	X			X	X		3	3	3
119 (Yellow)	P135 4	135 4	Fuel Pump Delivery Pressure Sensor Circuit - shorted low		X	X			X	X		3	3	3
121 (Yellow)	P190 10	190 10	Engine Speed/Position Sensor Circuit - lost one of two signals from the magnetic pickup sensor		X	X	X	X	X	X	X	2	2	2
122 (Yellow)	P102 3	102 3	Intake Manifold Pressure Sensor #1 Circuit - shorted high	X	X	X	X	X	X	X	X	2	2	2
123 (Yellow)	P102 4	102 4	Intake Manifold Pressure Sensor #1 Circuit - shorted low	X	X	X	X	X	X	X	X	2	2	2
124* (Yellow)		102 16	High Intake Manifold Pressure Left Bank								X	3	3	3
125* (None)		102 18	Low Intake Manifold Pressure Left Bank								X	3	3	3
126* (Yellow)		1129 16	High Intake Manifold Pressure Right Bank								X	3	3	3
127* (None)		1129 18	Low Intake Manifold Pressure Right Bank								X	3	3	3
128* (None)		1129 3	Right Bank Intake Manifold Pressure Sensor Circuit Failed High								X	3	3	3

(*) Denotes Cense Fault codes

(**) HHP QSK45/60/78 Fault Severity Levels:

Level 1: Stop Engine Now Level 3: Repair at Next PM
Level 2: Repair Engine Same Day Level 4: Information Only

FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
129* (None)		1129 4	Right Bank Intake Manifold Pressure Sensor Circuit Failed Low								X	3	3	3
131 (Red)	P091 3	091 3	Accelerator Pedal Position Sensor Circuit - shorted high	X	X	X	X	X	X	X	X	2	2	2
132 (Red)	P091 4	091 4	Accelerator Pedal Position Sensor Circuit - shorted low	X	X	X	X	X	X	X	X	2	2	2
133 (Red)	P029 3	974 3	Remote Accelerator Pedal Position Sensor Circuit - shorted high	X	X	X	X	X			X			
133 (Red)	P029 3	29 3	Remote Accelerator Pedal Position Sensor Circuit - shorted high						X	X		2	2	2
134 (Red)	P029 4	974 4	Remote Accelerator Pedal Position Sensor Circuit - shorted low	X	X	X	X	X			X			
134 (Red)	P029 4	29 4	Remote Accelerator Pedal Position Sensor Circuit - shorted low						X	X		2	2	2
135 (Yellow)	P100 3	100 3	Engine Oil Pressure Sensor Circuit - shorted high	X	X	X	X	X	X	X	X	2	2	2
136* (None)		1208 3	Pre Filter Oil Pressure Sensor Circuit Failed High								X	3	3	3
137* (None)		1208 4	Pre Filter Oil Pressure Sensor Circuit Failed Low								X	3	3	3
141 (Yellow)	P100 4	100 4	Engine Oil Pressure Sensor Circuit - shorted low	X	X	X	X	X	X	X	X	2	2	2
143 (Yellow)	P100 1	100 18	Engine Oil Pressure Low – Warning	X	X	X	X	X			X			
143 (White)	P100 1	100 1	Engine Oil Pressure Low – Warning						X	X		1	1	1
144 (Yellow)	P110 3	110 3	Engine Coolant Temperature Sensor Circuit - shorted high	X	X	X	X	X	X	X	X	2	2	2
145 (Yellow)	P110 4	110 4	Engine Coolant Temperature Sensor Circuit - shorted low	X	X	X	X	X	X	X	X	2	2	2
146 (Yellow)	P110 0	110 16	Engine Coolant Temperature High – Warning	X	X	X								
147 (Red)	P091 8	091 8	Accelerator Pedal Position Sensor Circuit - low frequency	X	X	X	X	X	X	X	X	2	2	2
148 (Red)	P091 8	091 8	Accelerator Pedal Position Sensor Circuit - high frequency	X	X	X	X	X	X	X	X	2	2	2

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	FMI	FMI										HHP Level Number (**)		
151 (Red)	P110 0	110 0	Engine Coolant Temperature High – Critical	X	X	X	X	X			X			
151 (White)	P110 0	110 0	Engine Coolant Temperature High – Critical						X	X		1	1	1
153 (Yellow)	P105 3	105 3	Intake Manifold Temperature Sensor #1 Circuit - shorted high	X	X	X	X	X	X	X	X	2	2	2
154 (Yellow)	P105 4	105 4	Intake Manifold Temperature Sensor #1 Circuit - shorted low	X	X	X	X	X	X	X	X	2	2	2
155 (Red)	P105 0	105 0	Intake Manifold Temperature #1 High - Critical	X	X	X	X	X			X			
155 (White)	P105 0	105 0	Intake Manifold Temperature #1 High – Critical						X	X		1	1	1
156* (Yellow)		1131 3	Left Bank Rear Intake Manifold Temp Sensor Circuit Failed High									2	2	2
157* (Yellow)		1131 4	Left Bank Rear Intake Manifold Temp Sensor Circuit Failed Low									2	2	2
158* (White)		1131 0	High Intake Manifold Temp - Left Bank Rear									1	1	1
159* (Yellow)		1132 3	Right Bank Front Intake Manifold Temperature Sensor Circuit Failed High									2	2	2
161* (Yellow)		1132 4	Right Bank Front Intake Manifold Temperature Sensor Circuit Failed Low									2	2	2
162* (White)		1132 0	High Intake Manifold Temperature - Right Bank Front									1	1	1
163* (Yellow)		1133 3	Right Bank Rear Intake Manifold Temperature Sensor Circuit Failed High									2	2	2
164* (Yellow)		1133 4	Right Bank Rear Intake Manifold Temperature Sensor Circuit Failed Low									2	2	2
165* (White)		1133 0	High Intake Manifold Temperature - Right Bank Rear									1	1	1
166 (Yellow)	S024 3	733 3	Rack Position Sensor #1 Circuit - shorted high								X			
172 (Red)	S023 6	638 6	Rack Actuator Position #1 Circuit - grounded circuit								X			
173 (Yellow)	S023 7	638 7	Rack Actuator - mechanically stuck open								X			

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HHP Level Number (**)														
184 (Yellow)	S233 2	609 2	Engine Control Module Identification Input State Error	X	X	X					X			
185 (Yellow)	S231 2	639 2	Engine Control Module Network Communication Error								X			
187 (Yellow)	S232 4	620 4	Sensor Supply Voltage #2 Circuit - shorted low				X	X						
211 (None)	S216 11	1484 31	Additional OEM/Vehicle Diagnostic Codes have been logged. Check other ECM's for DTC's.				X	X						
211* (None)		613 14	OEM Component Failure								X	3	3	3
212 (Yellow)	P175 3	175 3	Engine Oil Temperature Sensor Circuit - shorted high				X	X			X			
212* (Yellow)		175 3	Engine Oil Temperature Sensor Circuit - shorted high									2	2	2
213 (Yellow)	P175 4	175 4	Engine Oil Temperature Sensor Circuit - shorted low				X	X			X			
213* (Yellow)		175 4	Engine Oil Temperature Sensor Circuit - shorted low									2	2	2
214 (Red)	P175 0	175 0	Engine Oil Temperature High - Critical				X	X						
214* (White)		175 0	Engine Oil Temperature High - Critical									1	1	1
219 Maint.	P17 1	1380 17	Low Oil Level in the Centinel makeup oil tank				X	X						
219 (White)	P17 1	1380 1	Low Oil Level in the Centinel makeup oil tank						X	X		2	2	2
221 (Yellow)	P108 3	108 3	Ambient Air Pressure Sensor Circuit - shorted high		X	X	X	X	X	X	X	2	2	2
222 (Yellow)	P108 4	108 4	Ambient Air Pressure Sensor Circuit - shorted low		X	X	X	X	X	X	X	2	2	2
223 (Yellow)	S085 4	1265 4	Engine Oil Burn Valve Solenoid Circuit - shorted low				X	X	X	X		2	2	2
225 (Yellow)	S086 4	1266 4	Engine Oil Replacement Valve Solenoid Circuit - shorted low						X	X		2	2	2
227 (Yellow)	S232 3	620 3	Sensor Supply Voltage #2 Circuit - shorted high				X	X						

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HHP Level Number (**)														
231 (Yellow)	P109 3	109 3	Engine Coolant Pressure Sensor Circuit - shorted high						X	X	X	2	2	2
232 (Yellow)	P109 4	109 4	Engine Coolant Pressure Sensor Circuit - shorted low						X	X	X	2	2	2
233 (Yellow)	P109 1	109 18	Engine Coolant Pressure Low – Warning								X			
233 (White)	P109 1	109 1	Engine Coolant Pressure Low – Warning						X	X		1	1	1
234 (Red)	P190 0	190 0	Engine Speed High – Critical	X	X	X	X	X	X	X	X	3	3	3
235 (Red)	P111 1	111 1	Engine Coolant Level Low - Critical	X	X	X	X	X			X			
235 (White)	P111 1	111 1	Engine Coolant Level Low – Critical						X	X		1	1	1
237 (Yellow)	S030 2	644 2	External Speed Input (Multiple Unit Synchronization) - data incorrect				X		X	X		2	2	2
241 (Yellow)	P084 2	084 2	Vehicle Speed Sensor Circuit - data incorrect	X	X	X	X	X						
242 (Yellow)	P084 10	084 10	Vehicle Speed Sensor Circuit - tampering has been detected	X	X	X	X	X						
243 (Yellow)	P121 4	513 4	Engine Brake Driver #1 Circuit - shorted low	X	X	X								
245 (Yellow)	S033 4	647 4	Fan Clutch Circuit - shorted low	X	X	X	X	X						
252 (Yellow)	P098 2	098 2	Engine Oil Level #1 Sensor Circuit - data incorrect									2	2	2
253 (White)	P098 1	098 1	Engine Oil Level #1 Low – Critical									1	1	1
254 (Red)	S017 4	632 4	Fuel Shutoff Valve Circuit - shorted low				X	X			X			
254 (None)	S017 4	632 4	Fuel Shutoff Valve Circuit - shorted low						X	X		2	2	2
255 (Yellow)	S017 3	632 3	Fuel Shutoff Valve Circuit - shorted high				X	X						
259 (Red)	S017 7	632 7	Fuel Shutoff Valve - stuck open					X	X	X	X	2	2	2

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HHP Level Number (**)														
261 (Yellow)	P174 0	174 16	Fuel Temperature High – Warning	X										
261 (White)	P174 0	174 0	Fuel Temperature High – Warning						X	X		1	1	1
263 (Yellow)	P174 3	174 3	Fuel Temperature Sensor Circuit - shorted high		X	X			X	X		2	2	2
264 (Yellow)	P174 11	174 11	Fuel Temperature Sensor Circuit - data out-of-range	X										
265 (Yellow)	P174 4	174 4	Fuel Temperature Sensor Circuit - shorted low		X	X			X	X		2	2	2
268 (Yellow)	P094 2	94 2	Fuel Pressure Sensor Circuit - data incorrect		X	X								
271 (Yellow)	S126 4	1347 4	High Fuel Pressure Solenoid Valve #1 Circuit - shorted low		X	X								
272 (Yellow)	S126 3	1347 3	High Fuel Pressure Solenoid Valve #1 Circuit - shorted high		X	X								
273 (Yellow)	S127 4	1348 4	High Fuel Pressure Solenoid Valve #2 Circuit - shorted low		X	X								
274 (Yellow)	S127 3	1348 3	High Fuel Pressure Solenoid Valve #2 Circuit - shorted high		X	X								
275 (Yellow)	S126 7	1347 7	Fuel Pumping Element #1 (Front) - mechanically stuck		X	X								
276 (Yellow)	S018 3	633 3	Fuel Injection Control Valve Circuit - shorted high		X	X								
277 (Yellow)	S018 7	633 7	Fuel Injection Control Valve - mechanically stuck		X	X								
278 (Yellow)	P073 11	1075 11	Fuel Priming Pump Control Circuit - shorted high/low	X	X	X								
279 (Yellow)	S018 4	633 4	Fuel Injection Control Valve Circuit - shorted low		X	X								
281 (Yellow)	S126 7	1347 7	High Fuel Pressure Solenoid Valve #1 - mechanically stuck		X	X								
282 (Yellow)	S127 7	1348 7	High Fuel Pressure Solenoid Valve #2 - mechanically stuck		X	X								
283 (Yellow)	S221 3	1043 3	Engine Speed/Position Sensor #1 (Crankshaft) Supply Voltage Circuit - shorted high	X	X	X								

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												HHP Level Number (**)		
284 (Yellow)	S221 4	1043 4	Engine Speed/Position Sensor #1 (Crankshaft) Supply Voltage Circuit - shorted low	X	X	X		X						
285 (Yellow)	S231 9	639 9	SAE J1939 Multiplexing PGN Timeout Error	X	X	X	X	X						
286 (Yellow)	S231 13	639 13	SAE J1939 Multiplexing Configuration Error	X	X	X	X	X						
287 (Red)	P091 2	91 19	SAE J1939 Multiplexing Accelerator Pedal Sensor System Error	X	X	X	X	X						
288 (Red)	P029 2	974 19	SAE J1939 Multiplexing Remote Throttle Data Error	X	X	X	X	X						
292 (White)	P223 14	1083 14	Auxiliary Temperature Sensor Input # 1 Engine Protection - Critical						X	X		3	3	3
293 (Yellow)	S441 3	441 3	Auxiliary Temperature Sensor Input # 1 Circuit – shorted high											
293 (Yellow)	P223 3	1083 3	Auxiliary Temperature Sensor Input # 1 Circuit – shorted high						X	X		3	3	3
293 (Yellow)	S154 3	1083 3	Auxiliary Temperature Sensor Input # 1 Circuit – shorted high				X	X						
294 (Yellow)	S441 4	441 4	Auxiliary Temperature Sensor Input # 1 Circuit – shorted low											
294 (Yellow)	P223 4	1083 4	Auxiliary Temperature Sensor Input # 1 Circuit – shorted low						X	X		3	3	3
294 (Yellow)	S154 4	1083 4	Auxiliary Temperature Sensor Input # 1 Circuit – shorted low				X	X						
295 (Yellow)	P108 2	108 2	Ambient Air Pressure Sensor Circuit - data incorrect				X	X						
296 (Red)	P223 14	1387 14	Auxiliary Pressure Sensor Input # 2 Engine Protection - Critical	X	X	X								
296 (White)	P223 14	1084 14	Auxiliary Pressure Sensor Input # 2 Engine Protection - Critical						X	X		3	3	3
297 (Yellow)	P223 3	1387 3	Auxiliary Pressure Sensor Input # 2 Circuit – shorted high	X	X	X								
297 (Yellow)	P223 3	1084 3	Auxiliary Pressure Sensor Input # 2 Circuit – shorted high				X	X	X	X		3	3	3
298 (Yellow)	P223 4	1387 4	Auxiliary Pressure Sensor Input # 2 Circuit – shorted low	X	X	X								

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HHP Level Number (**)														
298 (Yellow)	P223 4	1084 4	Auxiliary Pressure Sensor Input # 2 Circuit – shorted low				X	X	X	X		3	3	3
299 (None)	S117 14	1384 31	Engine Shutdown Commanded by J1939						X	X		3	3	3
299 (Yellow)	S117 11	1384 31	Engine Shutdown Commanded by J1939				X	X						
311 (Yellow)	S001 6	651 6	Injector Solenoid Valve Cylinder #1 Circuit – grounded circuit				X	X						
312 (Yellow)	S005 6	655 6	Injector Solenoid Valve Cylinder #5 Circuit – grounded circuit				X	X						
313 (Yellow)	S003 6	653 6	Injector Solenoid Valve Cylinder #3 Circuit – grounded circuit				X	X						
314 (Yellow)	S006 6	656 6	Injector Solenoid Valve Cylinder #6 Circuit - grounded circuit				X	X						
315 (Yellow)	S002 6	652 6	Injector Solenoid Valve Cylinder #2 Circuit – grounded circuit				X	X						
316 (Yellow)	S078 3	931 3	Fuel Supply Pump Actuator Circuit - shorted high						X	X		3	3	3
318 (Yellow)	S078 7	931 7	Fuel Supply Pump Actuator – mechanically stuck						X	X		2	2	2
319 Maint.	P251 2	251 2	Real Time Clock - Power Interrupt	X	X	X	X	X						
321 (Yellow)	S004 6	654 6	Injector Solenoid Valve Cylinder #4 Circuit - grounded circuit				X							
322 (Yellow)	S001 5	651 5	Injector Solenoid Valve Cylinder #1 Circuit - open circuit				X							
323 (Yellow)	S005 5	655 5	Injector Solenoid Valve Cylinder #5 Circuit – open circuit				X							
324 (Yellow)	S003 5	653 5	Injector Solenoid Valve Cylinder #3 Circuit – open circuit				X							
325 (Yellow)	S006 5	656 5	Injector Solenoid Valve Cylinder #6 Circuit – open circuit				X							
328 (Yellow)	S152 7	1348 7	Fuel Pumping Element #2 (Rear) - mechanically stuck		X	X								
329 (Yellow)	S233 14	1077 14	Fuel System Leakage error		X	X								

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	FMI	FMI										HHP Level Number (**)		
331 (Yellow)	S002 5	652 5	Injector Solenoid Valve Cylinder #2 Circuit – open circuit				X							
332 (Yellow)	S004 5	654 5	Injector Solenoid Valve Cylinder #4 Circuit – open circuit				X							
341 (Yellow)	S253 2	630 2	Engine Control Module – data lost				X	X						
342 (Red)	S253 13	630 13	Engine Control Module – out of calibration								X			
343 (Yellow)	S254 12	629 12	Engine Control Module - Warning internal hardware failure				X	X	X	X	X	4	4	4
346 (Yellow)	S253 12	630 12	Engine Control Module - Warning Software error				X	X	X	X	X	4	4	4
349 (Yellow)	P191 0	191 16	Transmission Output Shaft (Tailshaft) Speed High – Warning	X	X	X	X	X						
349 (Yellow)	P191 0	191 0	Transmission Output Shaft (Tailshaft) Speed High – Warning						X	X		2	2	2
352 (Yellow)	S232 4	1079 4	Sensor Supply Voltage #1 Circuit - shorted low	X	X	X	X	X						
361 (Red)	S251 3	1076 3	Fuel Pump Control Module, Fuel Control Valve Circuit - shorted high	X										
362 (Yellow)	S251 4	1076 4	Fuel Pump Control Module, Fuel Control Valve Circuit - shorted low	X										
363 (Yellow)	S251 7	1076 7	Fuel Pump Control Module, Fuel Control Valve - mechanically stuck	X										
364 (Yellow)	S233 9	1077 9	Fuel Pump Control Module, CAN Communication Error - abnormal update rate	X										
365 (Yellow)	S233 4	1077 4	Fuel Pump Control Module, Supply Voltage Circuit - shorted low	X										
366 (Yellow)	S233 2	1077 2	Fuel Pump Control Module, Supply Voltage Circuit - data incorrect	X										
367 (Yellow)	P190 11	1078 11	Fuel Pump Control Module, Increment Angle Time Sensor Error	X										
368 (Yellow)	S254 8	1078 8	Fuel Pump Control Module, Timing Error	X										

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												HHP Level Number (**)		
369 (Yellow)	P190 2	1078 2	Fuel Pump Control Module, Engine Synchronization Error	X										
372 (Yellow)	S233 11	1077 11	Fuel Pump Control Module, Idle Validation Error	X										
373 (Red)	S233 3	1077 3	Fuel Pump Control Module, Fuel Shutoff Error	X										
374 (Yellow)	S233 12	1077 12	Fuel Pump Control Module, Self-Test Error	X										
375 (Yellow)	S254 2	629 2	Fuel Pump Control Module, Electronic Calibration Code Error	X										
376 (Yellow)	S233 13	1077 13	Fuel Pump Control Module, Fueling or Engine Speed Mismatch	X										
377 (Yellow)	S233 7	1077 7	Fuel Pump Control Module, Stuck Relay Error	X										
378 (Yellow)	S018 5	633 5	Fueling Actuator #1 Circuit - open circuit					X						
379 (Yellow)	S018 6	633 6	Fueling Actuator #1 Circuit - grounded circuit					X						
381 (Yellow)	S237 11	626 11	Intake Air Heater (Relay Enable) #1 Circuit - data incorrect	X	X	X								
382 (Yellow)	S237 11	626 11	Intake Air Heater (Relay Enable) #2 Circuit - data incorrect	X	X	X								
384 (Yellow)	S237 11	626 11	Start Assist Device Control Circuit Error (Ether Injection)						X	X		3	3	3
385 (Yellow)	S232 3	620 3	OEM Sensor Supply Voltage Circuit - shorted high	X	X	X								
386 (Yellow)	S232 3	1079 3	Sensor Supply Voltage #1 Circuit - shorted high	X	X	X	X	X						
387 (Yellow)	S221 3	1043 3	Accelerator Pedal Position Sensor Supply Voltage Circuit - shorted high	X	X	X	X	X						
389 (Yellow)	S033 11	647 11	Fan Clutch Circuit Error	X	X	X								
391 (Yellow)	S017 11	632 11	Fuel Shutoff Valve Supply Voltage error	X										
394 (Yellow)	S020 5	635 5	Timing Actuator #1 Circuit - open circuit					X						

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
395 (Yellow)	S020 6	635 6	Timing Actuator #1 Circuit - grounded circuit					X						
396 (Yellow)	S083 5	1244 5	Fueling Actuator #2 Circuit - open circuit					X						
397 (Yellow)	S083 6	1244 6	Fueling Actuator #2 Circuit - grounded circuit					X						
398 (Yellow)	S084 5	1245 5	Timing Actuator #2 Circuit - open circuit					X						
399 (Yellow)	S084 6	1245 6	Timing Actuator #2 Circuit - grounded circuit					X						
414* (Yellow)	S250 9	608 9	Data Communication error over the J1587 data link Circuit								X			
415 (Red)	P100 1	100 1	Engine Oil Pressure Low – Critical	X	X	X	X	X			X			
415 Level1	P100 1	100 1	Engine Oil Pressure Low – Critical						X	X		1	1	1
418 WIF / Maint.	P097 0	097 15	Water in Fuel Indicator High – Maintenance	X	X	X	X	X			X			
419 (Yellow)		1319 2	Intake Manifold Boost Pressure Imbalance								X			
422 (Yellow)	P111 2	111 2	Engine Coolant Level Sensor Circuit - data incorrect	X	X	X	X	X	X	X	X	2	2	2
423 (Yellow)	P156 2	156 2	Fuel Timing Pressure or Timing Actuator Stuck						X	X	X	2	2	2
426 (None)	S231 2	639 2	SAE J1939 datalink - cannot transmit				X	X						
426 (Yellow)	S231 2	639 2	SAE J1939 datalink - cannot transmit						X	X		3	3	3
426* (None)		639 2	SAE J1939 datalink - cannot transmit									3	3	3
427 (None)	S231 9	639 9	SAE J1939 not fast enough						X	X		4	4	4
428 (Yellow)	P097 3	97 3	Water in Fuel Sensor Circuit - shorted high				X	X			X			

(*) Denotes Cense Fault codes

(**) HHP QSK45/60/78 Fault Severity Levels:

Level 1: Stop Engine Now Level 3: Repair at Next PM
Level 2: Repair Engine Same Day Level 4: Information Only

FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
429 (Yellow)	P097 4	097 4	Water in Fuel Sensor Circuit - shorted low	X	X	X	X	X			X			
431 (Yellow)	S230 2	558 2	Accelerator Pedal Idle Validation Circuit - data incorrect	X	X	X	X	X			X			
431 (Yellow)	P091 2	91 2	Accelerator Pedal Idle Validation Circuit - data incorrect						X	X		3	3	3
432 (Red)	S230 13	558 13	Accelerator Pedal Idle Validation Circuit - out of calibration	X	X	X	X	X			X			
432 (Red)	P091 13	91 13	Accelerator Pedal Idle Validation Circuit - out of calibration						X	X		3	3	3
433 (Yellow)	P102 2	102 2	Intake Manifold Pressure Sensor Circuit - data incorrect	X	X	X	X	X						
434 (Yellow)	S251 2	627 2	Power Lost without Ignition Off	X	X	X	X	X						
435 (Yellow)	P100 2	100 2	Engine Oil Pressure Sensor Circuit - data incorrect				X	X						
441 (Yellow)	P168 1	168 18	Battery #1 Voltage Low - Warning	X	X	X	X	X			X			
441 (None)	P168 1	168 1	Battery #1 Voltage Low - Warning						X	X		3	3	3
442 (Yellow)	P168 0	168 16	Battery #1 Voltage High - Warning	X	X	X	X	X			X			
442 (Yellow)	P168 0	168 0	Battery #1 Voltage High - Warning						X	X		2	2	2
443 (Yellow)	S221 4	1043 4	Accelerator Pedal Position Sensor Supply Voltage Circuit - shorted low	X	X	X	X	X						
444 (Yellow)	S232 1	620 18	OEM Sensor Supply Voltage Low - Warning	X	X	X								
446* (None)		N/A	GSP Communication Failure								X	4	4	4
447* (None)		N/A	RPC Number Not Supported								X	4	4	4
448* (None)		N/A	RPC Argument Mismatch								X	4	4	4
449 (Yellow)	P094 0	094 16	Fuel Pressure High - Warning		X	X		X						

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(**) HHP QSK45/60/78 Fault Severity Levels:

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Level 4: Information Only

FAULT CODE (LAMP)	SID(S) PID(P)	SPN	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
	FMI	FMI										HHP Level Number (**)		
451 (Yellow)	P157 3	157 3	Injector Metering Rail #1 Pressure Sensor Circuit - shorted high		X	X		X						
451 (Red)	P157 3	157 3	Injector Metering Rail #1 Pressure Sensor Circuit - shorted high						X	X		2	2	2
452 (Yellow)	P157 4	157 4	Injector Metering Rail #1 Pressure Sensor Circuit - shorted low		X	X		X						
452 (Red)	P157 4	157 4	Injector Metering Rail #1 Pressure Sensor Circuit - shorted low						X	X		2	2	2
455 (Red)	S018 3	633 3	Fuel Control Valve Circuit - shorted high						X	X		2	2	2
466 (Yellow)	S032 4	1188 4	Turbocharger #1 Wastegate Control Circuit - shorted low					X						
467 (Yellow)	S020 2	635 2	Timing Rail Actuator Circuit - data incorrect						X	X		2	2	2
468 (Yellow)	S018 2	633 2	Fuel Rail Actuator Circuit - data incorrect						X	X		2	2	2
471 Maint.	P098 1	98 1	Engine Oil Level Low – Maintenance									1	1	1
472 Maint.	P017 2	1380 2	Engine Oil Level #2 Low – Maintenance									3	3	3
473 (Yellow)	P017 2	1380 2	Engine Oil Level #2 Low – Warning									2	2	2
479* (None)		1318 9	Exhaust Port Temperature Bank Imbalance								X			
482 (Yellow)	P094 1	094 18	Fuel Pressure Low - Warning					X						
483 (Yellow)	P129 3	1349 3	Injector Metering Rail #2 Pressure Sensor Circuit - shorted high					X						
484 (Yellow)	P129 4	1349 4	Injector Metering Rail #2 Pressure Sensor Circuit - shorted low					X						
485 (Yellow)	P129 0	1349 16	Injector Metering Rail #2 Pressure High - Warning					X						
486 (Yellow)	P129 1	1349 18	Injector Metering Rail #2 Pressure Low - Warning					X						
487 (None)	S237 1	626 1	Start Assist Device - Canister Empty (Ether Injection)						X	X		3	3	3

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(**) HHP QSK45/60/78 Fault Severity Levels:

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSM15	QSM19	QSM23	QSM30	QSK45	QSK60	QSK78
HHP Level Number (**)														
488 (Yellow)	P105 0	105 16	Intake Manifold Temperature High – Warning	X	X	X								
489 (Yellow)	P191 1	191 18	Transmission Output Shaft (Tailshaft) Speed Low – Warning	X	X	X	X	X						
489 (Yellow)	P191 1	191 1	Transmission Output Shaft (Aux Gov) Speed Low – Warning						X	X		2	2	2
493	S018 13	1076 13	Fuel Pump Calibration Trim Circuit Error		X	X								
496 (Yellow)	S221 11	1043 11	Engine Speed/Position Sensor #2 (Camshaft) Supply Voltage					X						
497 (Yellow)	S114 2	1377 2	Multiple Unit Synchronization Switch Circuit - data incorrect	X	X	X			X	X		2	2	2
514 (Red)	S018 7	633 7	Fuel Control Valve - mechanically stuck						X	X X		2	2	2
515 (Yellow)	P091 3	091 3	Accelerator Pedal Frequency Position Sensor Supply Circuit - shorted high	X	X	X								
516 (Yellow)	P091 4	091 4	Accelerator Pedal Frequency Position Sensor Supply Circuit - shorted low	X	X	X								
517 (Yellow)	S251 12	1076 12	Fuel Metering Solenoid - bad device	X										
524 (Yellow)	P113 2	113 2	OEM Alternate Droop Switch Validation - data incorrect	X	X	X					X			
527 (Yellow)	P154 3	702 3	Auxiliary Input/Output #2 Circuit - shorted high	X	X	X	X	X			X			
527 (Yellow)	S040 3	702 3	Auxiliary Input/Output #2 Circuit - shorted high						X	X		2	2	2
528 (Yellow)	P093 2	093 2	OEM Alternate torque validation switch - data incorrect	X	X	X	X	X			X			
529 (Yellow)	S051 3	703 3	Auxiliary Input/Output #3 Circuit - shorted high	X	X	X	X	X	X	X	X	2	2	2
539 (Yellow)	S018 11	633 11	Injector Control Valve Electronic Filter (Transorb) Error		X	X								
546 (Yellow)	P094 3	94 3	Fuel Delivery Pressure Sensor Circuit - shorted high					X						
547 (Yellow)	P094 4	94 4	Fuel Delivery Pressure Sensor Circuit - shorted low					X						

(*) Denotes Cense Fault codes

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
551 (Yellow)	S230 4	558 4	Accelerator Pedal Idle Validation Circuit - shorted low	X	X	X	X	X			X			
551 (Red)	P091 4	091 4	Accelerator Pedal Idle Validation Circuit - shorted low						X	X		2	2	2
553 (Yellow)	P157 0	157 16	Injector Metering Rail #1 Pressure High - warning level					X						
553 (Red)	P157 0	157 0	Injector Metering Rail #1 Pressure High - warning level						X	X		2	2	2
554 (Yellow)	P157 2	157 2	Fuel Pressure Sensor Error						X	X		2	2	2
555 (Yellow)	P022 0	1264 16	Engine Blowby - Warning Level								X			
555 (White)	P022 0	1264 0	Engine Blowby - Warning Level						X	X		1	1	1
581 (Yellow)	P015 3	1381 3	Fuel Supply Pump Inlet Pressure Sensor Circuit - shorted high				X	X			X			
582 (Yellow)	P015 4	1381 4	Fuel Supply Pump Inlet Pressure Sensor Circuit - shorted low				X	X			X			
583 (Yellow)	P015 1	1381 18	Fuel Supply Pump Inlet Pressure Low - warning level				X	X			X			
595 (Yellow)	P103 0	103 16	Turbocharger #1 Speed High - warning level					X						
596 (Yellow)	P167 0	167 16	Electrical Charging System Voltage High - warning level				X	X						
597 (Yellow)	P167 1	167 18	Electrical Charging System Voltage Low - Warning Level				X	X						
598 (Red)	P167 1	167 1	Electrical Charging System Voltage Low - Critical Level				X	X						
599 (Red)	S025 14	640 14	OEM Commanded Dual Output Shutdown	X	X	X								
611 (None)	S151 11	1383 31	Engine Hot Shutdown	X	X	X	X	X						
611 (None)	S151 14	1383 31	Engine Hot Shutdown						X	X	X	3	3	3
612* (Red)		99 1	High Lubricating Oil Filter Restriction								X	2	2	2

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
616* (None)		1173 16	High Turbo Compressor Inlet Temp RB									3	3	3
617* (None)		1172 0	High Turbo Compressor Inlet Temp LB								X			
621* (Yellow)		1137 18	Low #1 LB Cylinder Power								X	2	2	2
622* (Yellow)		1138 18	Low #2 LB Cylinder Power								X	2	2	2
623* (Yellow)		1139 18	Low #3 LB Cylinder Power								X	2	2	2
624* (Yellow)		1140 18	Low #4 LB Cylinder Power								X	2	2	2
625* (Yellow)		1141 18	Low #5 LB Cylinder Power								X	2	2	2
626* (Yellow)		1142 18	Low #6 LB Cylinder Power								X	2	2	2
627* (Yellow)		1143 18	Low #7 LB Cylinder Power										2	2
628* (Yellow)		1144 18	Low #8 LB Cylinder Power										2	2
631* (Yellow)		1143 (45) 1145 (60) 18	Low #1 RB Cylinder Power									2	2	2
631* (Yellow)		1329 1	Low #1 RB Cylinder Power								X			
632* (Yellow)		1144 (45) 1146 (60) 18	Low #2 RB Cylinder Power									2	2	2
632* (Yellow)		1329 1	Low #2 RB Cylinder Power								X			
633* (Yellow)		1145 (45) 1147 (60) 18	Low #3 RB Cylinder Power									2	2	2

(*) Denotes Cense Fault codes

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
												HHP Level Number (**)		
633* (Yellow)		1329 1	Low #3 RB Cylinder Power								X			
634* (Yellow)		1146 (45) 1148 (60) 18	Low #4 RB Cylinder Power									2	2	2
634* (Yellow)		1329 1	Low #4 RB Cylinder Power								X			
635* (Yellow)		1147 (45) 1149 (60) 18	Low #5 RB Cylinder Power									2	2	2
635* (Yellow)		1329 1	Low #5 RB Cylinder Power								X			
636* (Yellow)		1148 (45) 1150 (60) 18	Low #6 RB Cylinder Power									2	2	2
636* (Yellow)		1329 1	Low #6 RB Cylinder Power								X			
637* (Yellow)		1151 18	Low #7 RB Cylinder Power										2	2
638* (Yellow)		1152 18	Low #8 RB Cylinder Power										2	2
641* (Red)		1137 0	High #1 LB Cylinder Exhaust Temperature								X	2	2	2
642* (Red)		1138 0	High #2 LB Cylinder Exhaust Temperature								X	2	2	2
643* (Red)		1139 0	High #3 LB Cylinder Exhaust Temperature								X	2	2	2
644* (Red)		1140 0	High #4 LB Cylinder Exhaust Temperature								X	2	2	2
645* (Red)		1141 0	High #5 LB Cylinder Exhaust Temperature								X	2	2	2
646* (Red)		1142 0	High #6 LB Cylinder Exhaust Temperature								X	2	2	2

(*) Denotes Cense Fault codes

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 Level 1: Stop Engine Now Level 3: Repair at Next PM
 Level 2: Repair Engine Same Day Level 4: Information Only

FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
647* (Red)		1143 0	High #7 LB Cylinder Exhaust Temperature										2	2
648* (Red)		1144 0	High #8 LB Cylinder Exhaust Temperature										2	2
649 (None)	S115 0	1378 0	Change Lubricating Oil and Filter						X	X		3	3	3
651* (Red)		1143 (30,45) 1145 (60) 0	High #1 RB Cylinder Exhaust Temperature								X	2	2	2
652* (Red)		1144 (30,45) 1146 (60) 0	High #2 RB Cylinder Exhaust Temperature								X	2	2	2
653* (Red)		1145 (30,45) 1147 (60) 0	High #3 RB Cylinder Exhaust Temperature								X	2	2	2
654* (Red)		1146 (30,45) 1148 (60) 0	High #4 RB Cylinder Exhaust Temperature								X	2	2	2
655* (Red)		1147 (30,45) 1149 (60) 0	High #5 RB Cylinder Exhaust Temperature								X	2	2	2
656* (Red)		1148 (30,45) 1149 (60) 0	High #6 RB Cylinder Exhaust Temperature								X	2	2	2
657* (Red)		1150 0	High #7 RB Cylinder Exhaust Temperature										2	2
658* (Red)		1151 0	High #8 RB Cylinder Exhaust Temperature										2	2
659* (None)			Change fuel filter								X	4	4	4

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSM15	QSM19	QSK23	QST30	QSK45 HHP Level Number (**)	QSK60	QSK78
661* (Yellow)		1137 16	High #1 LB Cylinder Power									2	2	2
661* (Yellow)		1323 0	High #1 LB Cylinder Power								X			
662* (Yellow)		1138 16	High #2 LB Cylinder Power									2	2	2
662* (Yellow)		1324 0	High #2 LB Cylinder Power								X			
663* (Yellow)		1139 16	High #3 LB Cylinder Power									2	2	2
663* (Yellow)		1325 0	High #3 LB Cylinder Power								X			
664* (Yellow)		1140 16	High #4 LB Cylinder Power									2	2	2
664* (Yellow)		1326 0	High #4 LB Cylinder Power								X			
665* (Yellow)		1141 16	High #5 LB Cylinder Power									2	2	2
665* (Yellow)		1327 0	High #5 LB Cylinder Power								X			
666* (Yellow)		1142 16	High #6 LB Cylinder Power									2	2	2
666* (Yellow)		1328 0	High #6 LB Cylinder Power								X			
667* (Yellow)		1143 16	High #7 LB Cylinder Power										2	2
668* (Yellow)		1144 16	High #8 LB Cylinder Power										2	2
669* (None)			Change coolant filter								X	4	4	4
671* (None)		1137 4	Cyl #1 LB Exhaust Temp Sens Failed Low								X	4	4	4
672* (None)		1138 4	Cyl #2 LB Exhaust Temp Sens Failed Low								X	4	4	4
673* (None)		1139 4	Cyl #3 LB Exhaust Temp Sens Failed Low								X	4	4	4

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
674* (None)		1140 4	Cyl #4 LB Exhaust Temp Sens Failed Low								X	4	4	4
675* (None)		1141 4	Cyl #5 LB Exhaust Temp Sens Failed Low								X	4	4	4
676* (None)		1142 4	Cyl #6 LB Exhaust Temp Sens Failed Low								X	4	4	4
677* (None)		1143 4	Cyl #7 LB Exhaust Temp Sens Failed Low										4	4
678* (None)		1144 4	Cyl #8 LB Exhaust Temp Sens Failed Low										4	4
679* (None)			Change Coolant								X	X	4	4
691* (None)		1172 3	LBF Turbo Comp Inlet Temp Sens Failed High								X			
692* (None)		1172 4	LBR Turbo Comp Inlet Temp Sens Failed Low								X			
694* (None)		1173 3	RBF Turbo Comp Inlet Temp Sens Failed High									3	3	3
695* (None)		1174 4	RBR Turbo Comp Inlet Temp Sens Failed Low									3	3	3
711* (Yellow)		1143 (45) 1145 (60) 16	High #1 RB Cylinder Power									2	2	2
711* (Yellow)		1329 0	High #1 RB Cylinder Power								X			
712* (Yellow)		1144 (45) 1146 (60) 16	High #2 RB Cylinder Power									2	2	2
712* (Yellow)		1330 0	High #2 RB Cylinder Power								X			
713* (Yellow)		1145 (45) 1147 (60) 16	High #3 RB Cylinder Power									2	2	2

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
												HHP Level Number (**)		
713* (Yellow)		1331 0	High #3 RB Cylinder Power								X			
714* (Yellow)		1146 (45) 1148 (60) 16	High #4 RB Cylinder Power									2	2	2
714* (Yellow)		1332 0	High #4 RB Cylinder Power								X			
715* (Yellow)		1147 (45) 1148 (60) 16	High #5 RB Cylinder Power									2	2	2
715* (Yellow)		1333 0	High #5 RB Cylinder Power								X			
716* (Yellow)		1148 (45) 1149 (60) 16	High #6 RB Cylinder Power									2	2	2
716* (Yellow)		1334 0	High #6 RB Cylinder Power								X			
717* (Yellow)		1150 0	High #7 RB Cylinder Power										2	2
718* (Yellow)		1151 0	High #8 RB Cylinder Power										2	2
719 (Yellow)	P022 3	1264 3	Crankcase Blowby Pressure Sensor Circuit - shorted high						X	X	X	2	2	2
721* (None)		1143 (30,45) 1145 (60) 4	Cyl #1 RB Exhaust Temp Sens Failed Low								X	4	4	4
722* (None)		1144 (30,45) 1146 (60) 4	Cyl #2 RB Exhaust Temp Sens Failed Low								X	4	4	4

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FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
HHP Level Number (**)														
723* (None)		1145 (30,45) 1147 (60) 4	Cyl #3 RB Exhaust Temp Sens Failed Low								X	4	4	4
724* (None)		1146 (30,45) 1148 (60) 4	Cyl #4 RB Exhaust Temp Sens Failed Low								X	4	4	4
725* (None)		1147 (30,45) 1149 (60) 4	Cyl #5 RB Exhaust Temp Sens Failed Low								X	4	4	4
726* (None)		1148 (30,45) 1150 (60) 4	Cyl #6 RB Exhaust Temp Sens Failed Low								X	4	4	4
727* (None)		1151 4	Cyl #7 RB Exhaust Temp Sens Failed Low										4	4
728* (None)		1152 4	Cyl #8 RB Exhaust Temp Sens Failed Low										4	4
729 (Yellow)	P022 4	1264 4	Crankcase Blowby Pressure Sensor Circuit - shorted low						X	X	X	2	2	2
747* (None)			Trend Data Memory Nearly Full								X	4	4	4
748* (None)			Trend Data Memory Full								X	3	3	3
749* (None)			Fault Log Snapshot Data Nearly Full								X	4	4	4
753 (None)	S064 2	723 2	Engine Speed/Position #2 - Cam sync error					X	X	X		3	3	3
754* (None)			Fault Log Snapshot Data Full								X	3	3	3
755 (Yellow)	P157 7	157 7	Injector Metering Rail #1 Pressure Malfunction					X						

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 Level 2: Repair Engine Same Day Level 4: Information Only

FAULT CODE (LAMP)	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
												HHP Level Number (**)		
756* (None)			Change Lubricating Oil Filters								X	4	4	4
757* (None)			Catastrophic Power Loss - ECM Data Lost								X	4	4	4
758 (Yellow)	P129 7	1349 7	Injector Metering Rail #2 Pressure Malfunction					X						
768 (Yellow)	S009 11	923 11	Output Device Driver (VGT or Transmission shift PWM signal)	X	X	X								
777 (Yellow)	P173 0	1180 0	Turbocharger #1 Turbine Inlet Temperature High - warning level						X			2	2	2
779 (Yellow)	S051 11	703 11	Auxiliary Equipment Sensor Input # 3 (OEM Switch)	X	X	X								
783			Rapid Rise in Intake Manifold Temperature LBF										1	1
951 (None)	P166 2	166 2	Cylinder Power Imbalance between cylinders				X	X						
1000* (None)			Vehicle Controller initiated fault log								X			
2144* 0		1153 0	High #9 LB Cylinder Exhaust Temperature											2
2145* 0		1154 0	High #9 RB Cylinder Exhaust Temperature											2
2146* 4		1153 4	Exhaust Gas Temperature Sensor Circuit Failed Low Cyl # 9 RB											4
2147* 4		1154 4	Exhaust Gas Temperature Sensor Circuit Failed Low Cyl # 9 LB											4
2148* 0		1340 16	High Power – Cylinder # 9 Left Bank											2
2149* 16		1341 16	High Power – Cylinder # 9 Right Bank											2
2151* 18		1340 18	Low Power – Cylinder # 9 Left Bank											2
2152* 18		1341 18	Low Power – Cylinder # 9 Right Bank											2
2154* (None)		611 3	Post-Filter Oil Pressure Sensor Circuit-Shorted high								X	3	3	3

(*) Denotes Cense Fault codes

(**) HHP QSK45/60/78 Fault Severity Levels:

Level 1: Stop Engine Now Level 3: Repair at Next PM
Level 2: Repair Engine Same Day Level 4: Information Only

FAULT CODE (LAMP)	SID(S) PID(P)	SPN	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSM15	QSK19	QSK23	QST30	QSK45	QSK60	QSK78
	FMI	FMI										HHP Level Number (**)		
2155* (None)		611 4	Post-Filter Oil Pressure Sensor Circuit-Shorted Low								X	3	3	3
2157*		1131 10	Rapid Rise in Intake Manifold Temperature LBR										1	1
2158*		1132 10	Rapid Rise in Intake Manifold Temperature RBF										1	1
2159*		1133 10	Rapid Rise in Intake Manifold Temperature RBR										1	1
2194* (Yellow)	P223 11	1387 11	Auxiliary Equipment Sensor Input # 2 (OEM Pressure Sensor) Engine Protection – Warning	X	X	X								
2195* (Red)	S051 14	703 14	Auxiliary Equipment Sensor Input # 3 (OEM Switch) Engine Protection - Critical	X	X	X								
2241*			Left Bank Middle High Intake Manifold Temperature - EP											2
2242*			Left Bank Middle Intake Manifold Temp Sensor Circuit Failed High											2
2243*			Left Bank Middle Intake Manifold Temp Sensor Circuit Failed Low											2
2244*			Rapid Rise in Intake Manifold Temperature LBM											2
2245*			Right Bank Middle High Intake Manifold Temperature - EP											2
2246*			Right Bank Middle Intake Manifold Temp Sensor Circuit Failed High											2
2247*			Right Bank Middle Intake Manifold Temp Sensor Circuit Failed Low											2
2248*			Rapid Rise in Intake Manifold Temperature RBM											2
2251*			Front Intercooler Boost Pressure High											2
2252*			Front Intercooler Boost Pressure Low											2
2253*			Front Intercooler Boost Pressure Out of Range High											2
2254*			Front Intercooler Boost Pressure Out of Range Low											2
2255*			Rear Intercooler Boost Pressure High											2
2256*			Rear Intercooler Boost Pressure Low											2
2257*			Rear Intercooler Boost Pressure Out of Range High											2
2258*			Rear Intercooler Boost Pressure Out of Range Low											2

(*) Denotes Cense Fault codes

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